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A review of the wolf spider genus *Bogdocosa* (Araneae, Lycosidae)

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Abstract

Bogdocosa Ponomarev & Belosludtsev, 2008 is reviewed, two new combinations are proposed: *Bogdocosa flavida* (O. Pickard-Cambridge, 1885), **comb. nov.** (from Gansu, Inner Mongolia and Xinjiang of China) and *B. multivaga* (Simon, 1880), **comb. nov.** (from Hebei and Inner Mongolia of China). *Pardosa xinjiangensis* Hu & Wu, 1989, **syn. nov.** is synonymized with *B. flavida* (O. Pickard-Cambridge, 1885). Additionally, a new species is described based on both sexes from Xinjiang: *B. yunshani* Wang, Marusik & Zhang, **sp. nov.** Detailed species descriptions, morphological photos, illustrations of copulatory organs, and a distribution map of the genus are presented.

Key Words

Central Asia, China, description, morphology, taxonomy

Introduction

The wolf spider genus *Bogdocosa* Ponomarev & Belosludtsev, 2008 is a monotypic group known from the Central Palaearctic: from eastern Caucasus to northern Xinjiang and south to northern Iran and southern Tajikistan (Esyunin and Ponomarev 2018; WSC 2025). The type species, *Bogdocosa baskuntchakensis* Ponomarev & Belosludtsev, 2008 and *Pardosa beijiangensis* Hu & Wu, 1989 (from Xinjiang of China) were considered as junior synonym of *B. kronebergi* (Andreeva, 1976) (Esyunin and Ponomarev 2018).

Chen and Song (2004) suggested that *P. beijiangensis* should be placed in the *Pardosa multivaga*-group, which was first proposed by Yin et al. (1997) to contain three species: *P. multivaga* Simon, 1880, *P. sinensis* Yin et al., 1995 and *P. xinjiangensis* Hu & Wu, 1989. The synonym of *P. beijiangensis* with *B. kronebergi* and the published description of *P. multivaga* and *P. xinjiangensis* suggest that the remaining two species can be transferred to the genus *Bogdocosa*.

Here we review *Bogdocosa* primarily based on specimens from China: synonymization of *P. xinjiangensis* with *P. flavida* and its transfer to *Bogdocosa*, along with the formal transfer of *P. multivaga* to this genus. Furthermore, we describe a new species from Xinjiang in China and provide photos and illustrations of *B. kronebergi* based on newly collected specimens.

Material and methods

All specimens were preserved in 75% ethanol and examined, illustrated, photographed and measured using a Leica M205A stereomicroscope equipped with a drawing tube, a Leica DFC450 camera, and Leica Application

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Suite software (version 4.6). Male palps and female epigynes were examined and illustrated after dissection. Epigynes were cleared in pancreatin (Álvarez-Padilla and Hormiga 2007). Leg measurements are shown as: total length (femur, patella + tibia, metatarsus, tarsus). All measurements are in millimetres. Specimens examined here are deposited in the spider collection at the School of Life Sciences, Southwest University, Chongqing of China (**SWUC**) and the Zoological Museum of the University of Turku (**ZMUT**).

Abbreviations used in the text: **ALE**, anterior lateral eye; **AME**, anterior median eye; **PLE**, posterior lateral eye; **PME**, posterior median eye.

Taxonomy

Family Lycosidae Sundevall, 1833

Genus *Bogdocosa* Ponomarev & Belosludtsev, 2008

Bogdocosa Ponomarev & Belosludtsev, in Ponomarev et al. 2008: 163.
Bogdocosa Esyunin & Ponomarev, 2018: 62.

Type species. *Bogdocosa baskuntchakensis* Ponomarev & Belosludtsev, 2008.

Diagnosis. Males of *Bogdocosa* can be distinguished from those of all other lycosid genera by the strong erected setae on the male sternum (vs. absent) and median apophysis with 3 branches (vs. 2).

Females of *Bogdocosa* differ from those of most lycosid genera by having the median plate of the epigyne covered with setae together with the lack of septum (vs. setae absent or present on septum only (*Arctosa* C. L. Koch, 1847, Evippinae) and having strongly sclerotized anterior margins of the epigyne (epigynal lobes), extending the median plate (little in *B. kronebergi*, and strongly in other species; absent in *Aulonia* C. L. Koch, 1847 and *Halocosa* Azarkina & Trilikauskas, 2019).

Description. Medium-sized (4.0–8.5). Carapace pear-shaped, yellowish-brown, with wide light median band starting anteriorly from PLE and reaching posterior edge, two longitudinal dark bands, and light marginal stripes. Cervical groove and radial furrows indistinct. Eye region black except space between PLE. Sternum yellowish-brown to grey-brown, males with spine-like black setae. Legs yellowish-brown. Leg formula: 4123 or 4132.

Abdomen oval, yellowish-brown to grey-brown, with wide median band, lateral sides covered with black or brown setae. Heart mark distinct, lanceolate. Spinnerets pale yellow.

Palp (Figs 2A–C, 3A–G, 5A–C, 6A–G, 8A–C, 9A–G, 11A–C, 12A–G, 14A–D) with tibial bulge. Cymbium droplet-shaped, 1.6–1.8 times longer than wide, tip short, about 1/4th of cymbial length and lacking claw-like setae, but with numerous apical strong spines. Bulb oval, ca 1.25–1.30 times longer than wide. Subtegulum large, about 0.27–0.41 of bulbal length, located postero-prolaterally. Tegulum long with total length of tegulum and conductor matching the bulb in length, with distinct median notch and retrolateral subtriangular lobe. Sperm duct makes deep loop around median notch. Conductor membranous, bifid or trifid. Median apophysis located medially, with 3 arms: prolateral, retrolateral and ventral. Terminal part with palea, terminal apophysis small, with hook-shaped tip, embolus filamentous, roundly bent, with or without lobe directed anteriorly on the embolic base.

Epigyne (Figs 1B, C, 2D, E, 4C, D, 5D, E, 7C, D, 8D, E, 10C, D, 11D, E, 13C, D) with pair of epigynal lobes located anteriorly or laterally and almost fusing anteriorly. Median plate oval or pentagonal-rectangular, covered with setae. Copulatory openings crack-like. Spermathecae subdivided into two parts, well distinct in all species, anterior part with distinct stalks and posterior part well distinct in type species only. Fertilization ducts crescent-shaped.

Composition. Four species: *Bogdocosa flavida*, *B. kronebergi*, *B. multivaga* and *B. yunshani* sp. nov.

Biology. *Bogdocosa* species inhabit open habitats in arid regions.

Distribution. China (Beijing, Inner Mongolia, Xinjiang, Ningxia, Qinghai, Gansu, Shaanxi, Shanxi, Hebei, Shandong), Russia (North Caucasus), Central Asia: Kazakhstan, Uzbekistan, Tajikistan, Azerbaijan and northern Iran (Fig. 16).

Bogdocosa flavida (O. Pickard-Cambridge, 1885), comb. nov.

Figs 1–4, 14A, 15A, 16
Vernacular name: 淡黄博狼蛛

Lycosa flavida O. Pickard-Cambridge, 1885: 93 (♀).
Pardosa flavida: Roewer 1955: 162.
Pardosa xinjiangensis Hu & Wu, 1989: 231, figs 191.1–7 (♂♀); Yin et al. 1997: 235, figs 111a–c (♀); Song et al. 1999: 335, figs 199G, O (♂♀); Hu 2001: 208, figs 107.1–7 (♂♀); Chen and Song 2004: 408, figs 29–37 (♂♀). Syn. nov.

Material examined. ♀ (***lectotype*, designated here**): Yarkand and neighbourhood, 11.1873; Kashghar, 12.1873; between Yangihissar and Sirikol, 03.1874; Yangihissar, 04.1874; road from Yarkand to Bursi, 28.05 to 17.06.1874. **China**, **Gansu:** 1♂2♀, Jiuquan City, Jinta Co., Yuanyangchi, 39°54'30"N, 98°50'6"E, elev. 1304 m, 28.07.2008, M.S. Zhu leg. • **Inner Mongolia:** 1♂, Alxa, Ejinaqi, Erdaoqiao Town, 41°58'14"N, 101°5'26"E, elev. 930 m, 5.06.2015, T. Lu and G.Q. Huang leg. • 1♂, Ejinaqi, Juyan L., 42°13'43"N, 101°4'24"E, elev. 906 m, 5.06.2015, T. Lu and G.Q. Huang leg. • 1♂5♀, Ejinaqi, 41°57'53"N, 101°2'49"E, elev. 939 m, 27.07.2008, M.S. Zhu leg. • **Xinjiang:** 9♂4♀, Qiemo Co., 38°11'39"N, 85°30'48"E, elev. 1252 m, 11.05.2013, L.Y. Wang leg. • 1♂3♀, Qiemo Co., 38°11'39"N, 85°30'48"E, elev. 1252

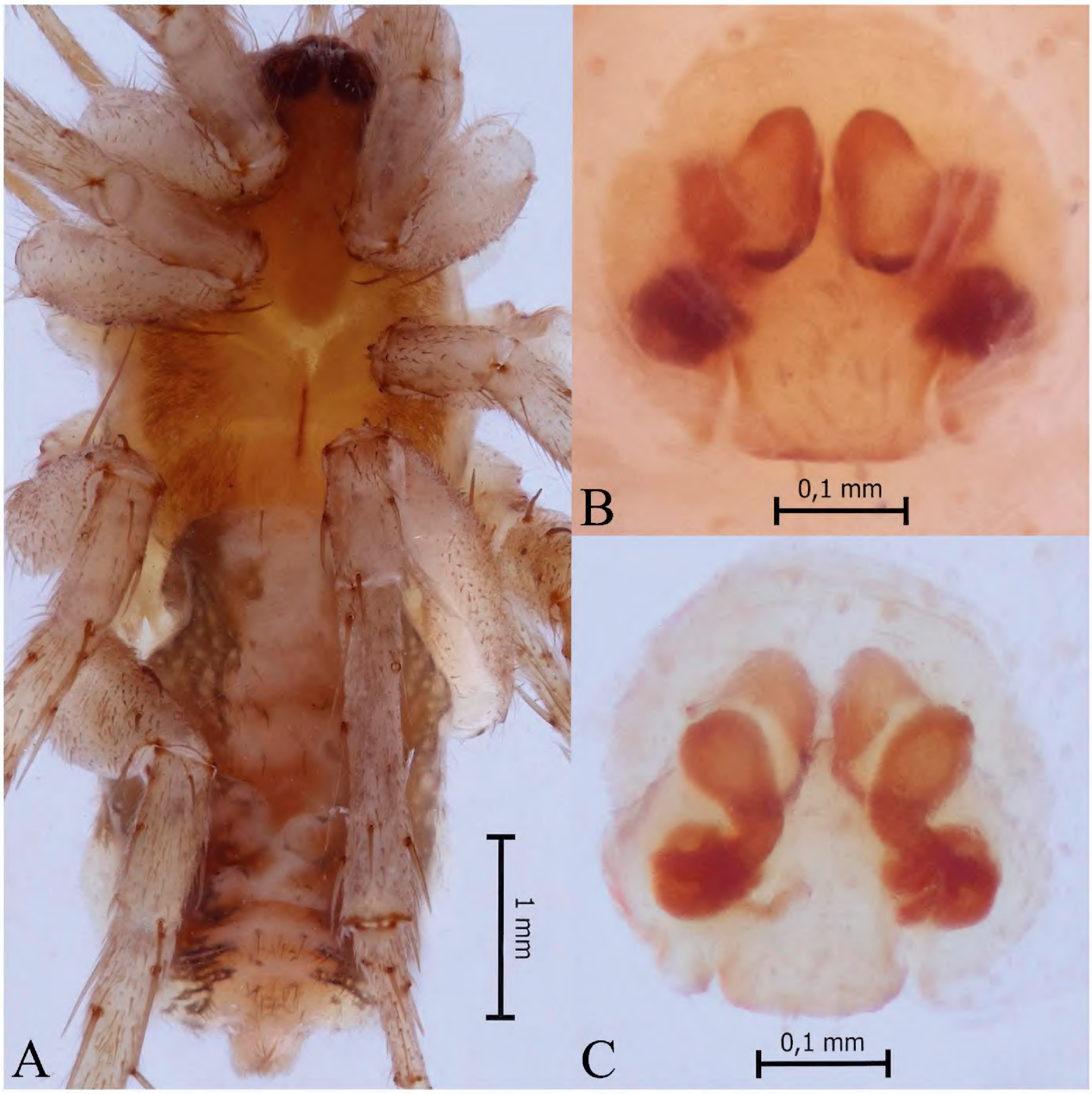

Figure 1. *Bogdocosa flavida* (O. Pickard-Cambridge, 1885), lectotype from Yarkand and neighbourhood, Kashghar, between Yangihissar and Sirikol, Yangihissar, or road from Yarkand to Bursi. **A.** Female habitus, dorsal view; **B.** Epigyne, ventral view; **C.** Same, dorsal view.

m, 31.07.2008, F. Zhang leg. • 1♂, Qiemo Co., Karamiran R. bank, 37°57'47"N, 84°26'47"E, elev. 1260 m, 2.06.2014, L.Y. Wang and X.K. Jiang leg. • 1♂1♀, Aksu, Kuqa Co., Tarim Township, 41°10'23"N, 83°35'36"E, elev. 950 m, 30.05.2009, D. Sun and Y.W. Zhao leg. • 2♀, Aksu City, 41°08'43"N, 80°11'53"E, elev. 1106 m, 9.08.2008, F. Zhang leg. • 2♀1♂, Korla City, Tashidian Town, 41°50'7"N, 86°16'36"E, elev. 1038 m, 25.05.2009, D. Sun and Y.W. Zhao leg. • 1♀, Ruoqiang Co., 39°1'22"N, 88°9'59"E, elev. 894 m, 30.07.2008, F. Zhang leg. • 1♂, Bohu Co., 42°2'33"N, 86°36'35"E, elev. 998 m, 8.05.2013, L.Y. Wang leg. • 2♂4♀, Turpan City, 43°01'24"N, 89°06'08"E, elev. 238 m, 27.07.2008, F. Zhang leg. • 1♀, Turpan City, Tuokexun Co., Xia Township, 42°47'13"N, 88°40'53"E, elev. -10 m, 4.08.2008, M.S. Zhu leg. • 3♀, Turpan City, Shanshan Co., 42°51'55"N, 90°12'19"E, elev. 364 m, 3.08.2008, F. Zhang leg. • 1♀, Hami City, Hami Park, 42°49'51"N, 93°30'56"E, elev. 759 m, 15.05.2009, D. Sun and Y.W. Zhao leg. • 4♂3♀, Hami City, Xiheba, 43°35'51"N, 92°59'57"E, elev. 1643 m, 16.05.2009, D. Sun and Y.W. Zhao leg. • 1♂, Hami City, Liushuquan Town, Baiyanggou, 43°0'28"N, 92°58'7"E, elev. 755 m, 18.04.2014, L.Y. Wang and X.W. Meng leg. • 4♀, Hami City, 42°46'46"N, 93°27'35"E, elev. 722 m, 24.07.2008, F. Zhang leg. • 5♀, Hotan, Yutian Co., 36°51'22"N, 81°40'37"E, elev. 1431 m, 3.08.2008, F. Zhang leg.

Note. *Lycosa flavida* was described based on females and subadult males from five localities. Among the types of species described by O. Pickard-Cambridge (1885) based on materials from the Second Yarkand Mission and stored in the Oxford University Museum of Natural History, we found only one vial containing one female that fits the species description (size and pattern). We here

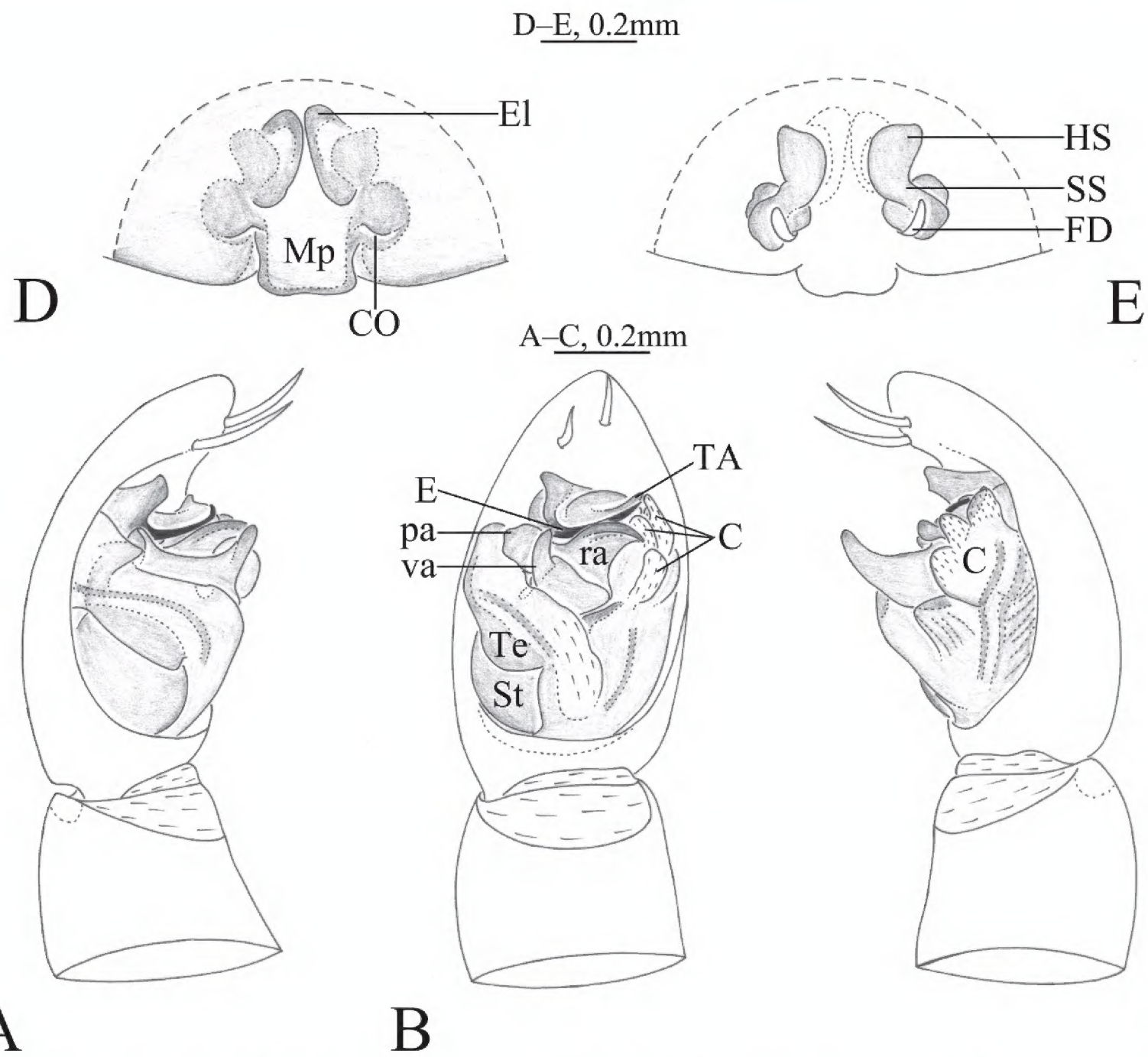

Figure 2. *Bogdocosa flavida* (O. Pickard-Cambridge, 1885). **A.** Left male palp, prolateral view; **B.** Same, ventral view; **C.** Same, retrolateral view; **D.** Epigyne, ventral view; **E.** Same, dorsal view. Abbreviations: C = conductor; CO = copulatory opening; E = embolus; El = epigynal lobe; FD = fertilization duct; HS = head of spermathecae; Mp = median plate; pa = prolateral arm of median apophysis; ra = retrolateral arm of median apophysis; SS = stalk of spermathecae; St = subtegulum; TA = terminal apophysis; Te = tegulum; va = ventral arm of median apophysis (specimens from Qiemo County, Xinjiang, China).

designate this single female examined by us as a lectotype to fix the species-group name of this species.

Diagnosis. *Bogdocosa flavida* is similar to *B. multivaga* and *B. yunshani* sp. nov. in having a pair of epigynal lobes (Figs 1B, 2D, 4C; 8D, 10C; 11D, 13C), but can be distinguished by ventral arm of median apophysis rod-shaped ventrally in *B. flavida* (Figs 2B, 3B, D, G, 14A) (vs. digitiform in *B. multivaga*, Figs 8B, 9B, D, G, 14C; sectorial in *B. yunshani* sp. nov., Figs 11B, 12B, D, G, 14D). Females can be distinguished by two epigynal lobes closely approximated with individual lobes 2 times as wide as long in *B. flavida* (Figs 1B, 2D, 4C) (vs. interlobar space narrower than lobe width with individual lobes 1.5 times as wide as long in *B. multivaga*, Figs 8D, 10C; interlobar space equal to lobe width and individual lobes as wide as long in *B. yunshani* sp. nov., Figs 11D, 13C).

Description. Male (Fig. 4A) total length 5.65. Carapace 2.98 long, 2.03 wide; abdomen 2.50 long, 1.75 wide. Eye sizes and interdistances: AME 0.14, ALE 0.16, PME 0.30, PLE 0.24; AME–AME 0.07, AME–ALE 0.04, PME–PME 0.19, PME–PLE 0.24. Clypeus 0.10 high. Leg measurements: I 7.91 (2.14, 2.76, 1.73, 1.28); II 7.06 (2.01, 2.23, 1.69, 1.13); III 7.37 (1.95, 2.39, 1.98, 1.05); IV 10.91 (2.70, 3.40, 3.36, 1.45).

Palp (Figs 2A–C, 3A–G, 14A). Terminal apophysis broad, with small tip. Prolateral arm of median apophysis sail-shaped ventrally. Retrolateral arm of median apophysis membranous. Ventral arm of median apophysis rod-shaped and narrower than retrolateral arm of median apophysis in ventral view. Lobe of embolic base extending ventrally. Embolus roundly bent. Conductor trifurcates.

Female (Fig. 4B) total length 7.27. Carapace 3.56 long, 2.54 wide; abdomen 3.80 long, 2.48 wide. Eye sizes and interdistances: AME 0.13, ALE 0.12, PME 0.37, PLE 0.29; AME–AME 0.11, AME–ALE 0.07, PME–PME 0.24, PME–PLE 0.31. Clypeus height 0.19. Leg measurements: I 9.47 (2.75, 3.23, 2.01, 1.48); II 8.82 (2.54, 2.94, 1.94, 1.40); III 8.86 (2.56, 2.61, 2.47, 1.22); IV 13.71 (3.62, 4.04, 4.28, 1.77).

Epigyne (Figs 1B, C, 2D, E, 4C, D). Epigynal lobes wider than long and closely approximated. Median plate square. Copulatory openings situated bilaterally on the median plate, with their orifices posteriorly oriented. Spermathecal heads oval.

Distribution. The species is known from Gansu, Qinghai and Xinjiang in China (sub. *Pardosa xinjiangensis* (Li and Lin 2016) most likely occurs in

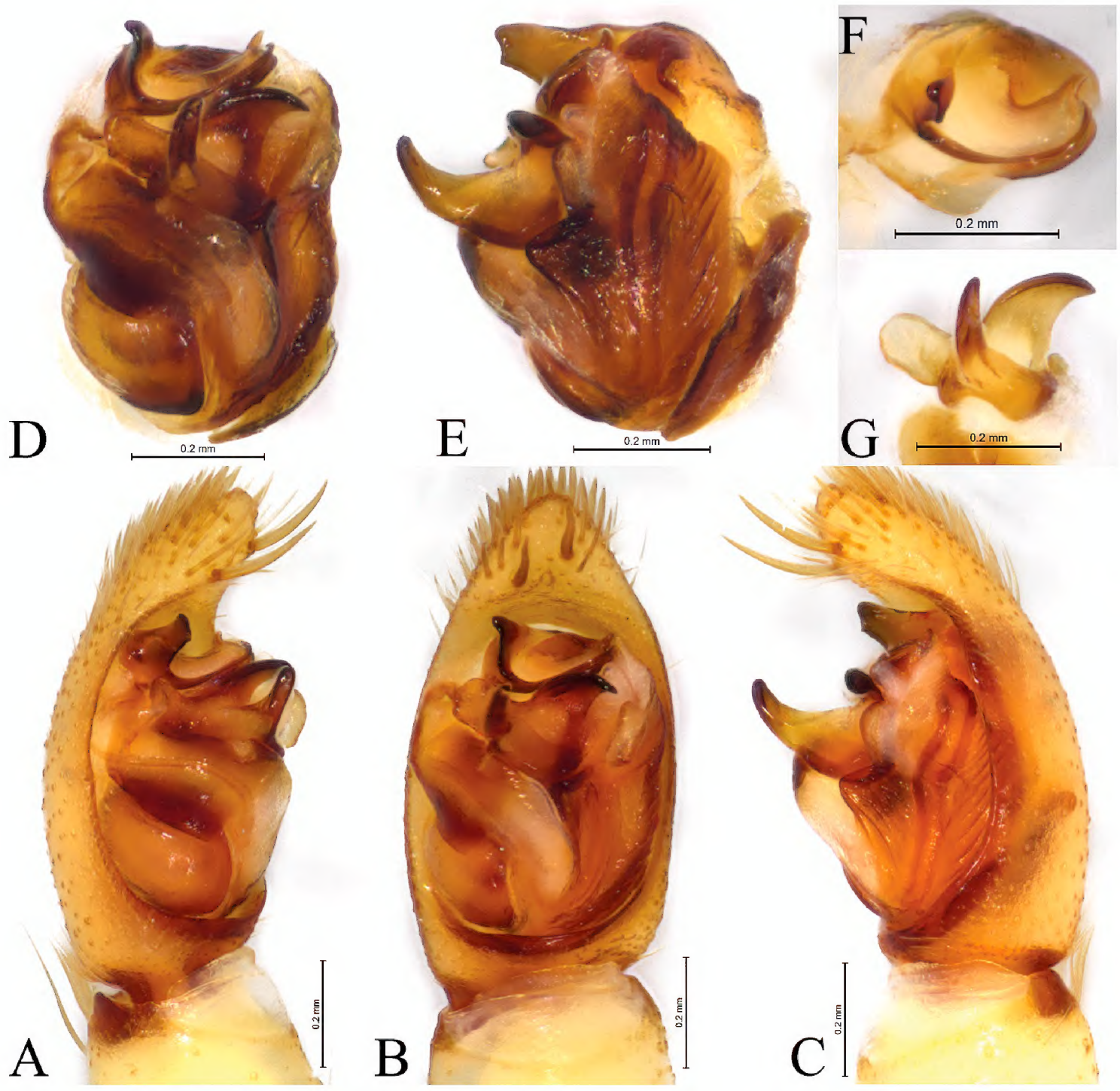

Figure 3. *Bogdocosa flavida* (O. Pickard-Cambridge, 1885). **A.** Left male palp, prolateral view; **B.** Same, ventral view; **C.** Same, retrolateral view; **D.** Palp bulb, ventral view; **E.** Same, retrolateral view; **F.** Terminal part, ventral view; **G.** Median apophysis, ventral view (specimen from Qiemo County, Xinjiang, China).

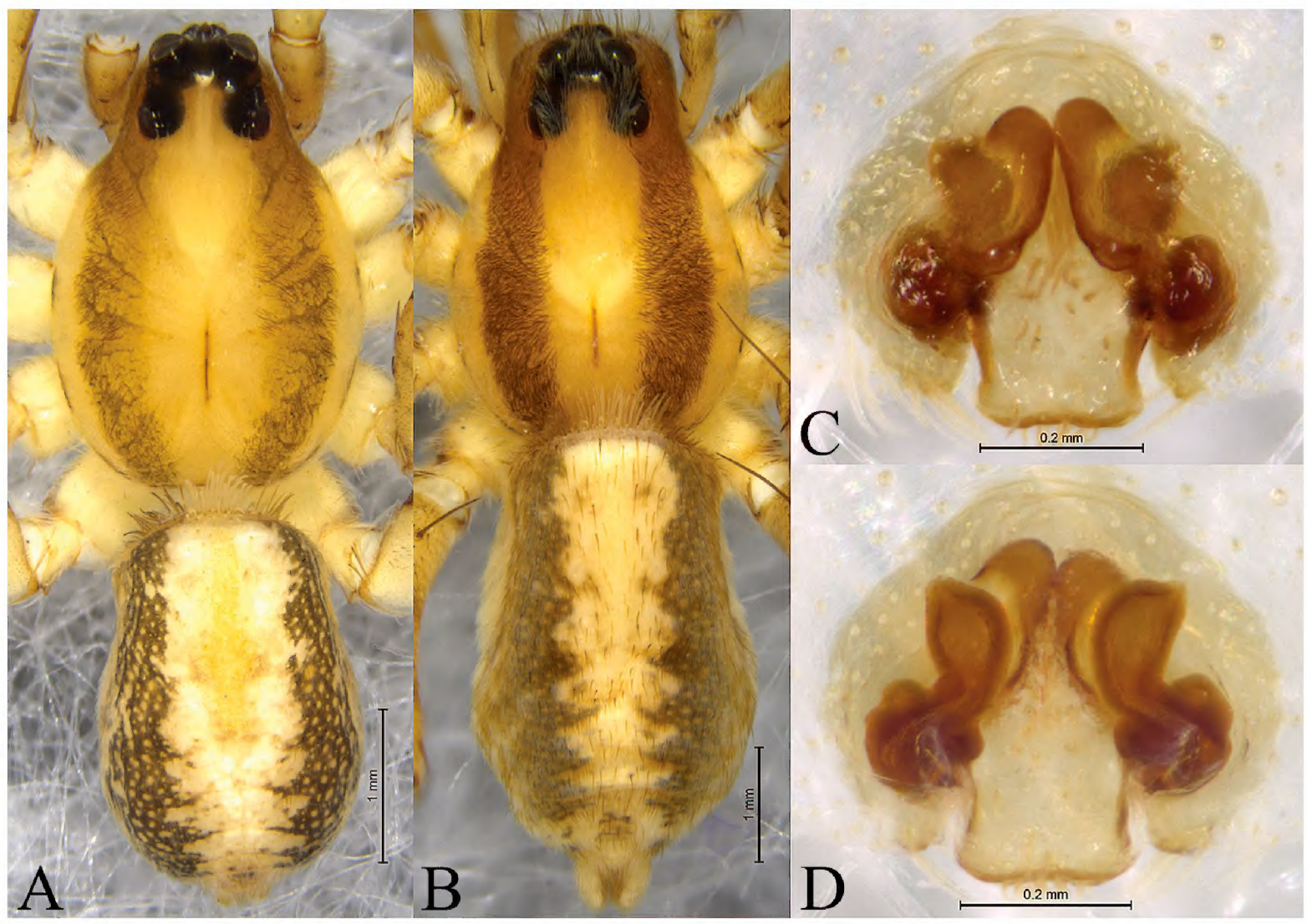

Figure 4. *Bogdocosa flavida* (O. Pickard-Cambridge, 1885). **A.** Male habitus, dorsal view; **B.** Female habitus, dorsal view; **C.** Epigyne, ventral view; **D.** Same, dorsal view (specimens from Qiemo County, Xinjiang, China).

Afghanistan and Jammu and Kashmir. Syntype series includes specimens from "Yarkand to Bursi" that may refer to India) (Fig. 16).

Remark. Although we did not examine the type specimens of *P. xinjiangensis*, the diagnostic characteristics of both females and males of this species are distinct in Hu and Wu (1989). Furthermore, based on our examination of the type specimens of *B. flavida* (Fig. 1) and additional specimens of *P. xinjiangensis* collected from Xinjiang, we confirm that *P. xinjiangensis* is conspecific with *B. flavida*.

Bogdocosa kronebergi (Andreeva, 1976)

Figs 5–7, 14B, 15B, 16

Vernacular name: 克氏博狼蛛

Tarentula latifasciata Kroneberg, 1875: 39, pl. 4, fig. 27e (♀ only, mismatched with holotype ♂).

Alopecosa kronebergi Andreeva, 1976: 45, figs 54–55 (♂♀).

Pardosa beijiangensis Hu & Wu, 1989: 210, figs 174.1–5 (♂♀); Zhao 1993: 85, figs 35a–c (♂♀); Zhao 1995: 803, figs 371a–c (♂♀); Song et al. 1999: 329, figs 193H, N (♂♀); Chen and Song 2004: 406, figs 1–9 (♂♀).

Bogdocosa baskuntchakensis Ponomarev, Belosludtsev & Dvadnenko, 2008: 164, figs 1–6 (♂♀); Mirshamsi et al. 2015: 101, figs 4–12 (♂♀).

Bogdocosa kronebergi Esyunin & Ponomarev, 2018: 64, figs 1–12, 14–18 (♂♀); Nuruyeva and Snegovaya 2023: 1982, figs 5–6 (♀).

Material examined. China, Xinjiang: 10♂11♀, Changji, Hutubi Co., Hutubi Park, 44°11'46"N, 86°52'46"E, elev. 521 m, 20.05.2022, Y.S. Yang leg. • 1♂, Shihezi City, Manasi Co., 44°47'19"N, 86°35'12"E, elev. 370 m, 7.05.2016, J. Su leg. • 1♂1♀, Tacheng, Tuoli Co., Tiechanggou Town, 46°10'44"N, 84°22'3"E, elev. 793 m, 13.06.2014, L.Y. Wang and X.K. Jiang leg. • **Armenia, Armavir Prov.:** 1♂ (subadult), collapsing clay cliffs and near water, 40°4'59"N, 44°11'26"E, 13.05.2021, YMM leg. • **Azerbaijan:** 2♀, CE Azerbaijan, Absheron Pen., Baku, Ganly-Gyol L., 40°21'27.6"N, 49°48'21.6"E, 20.05 & 6.06.2003, YMM leg. • **Tajikistan, Khatlon Area:** 2♀, Tigrovaya Balka Reserve, tugai forest with thick litter, 37°10'27.54"N, 68°23'2.82"E, elev. 316 m, 6.07.2015, YMM leg. (type locality). • 4♀, Shaartuz Distr., gorge: clay cliffs, under bushes, 37°4'32.88"N, 68°1'10.62"E, elev. 427 m, 20.04.2015, YMM leg. • 10♂2♀, Shaartuz Distr., Khushody, edge of sandy desert, *Tamarix* near water bodies, chiefly shrub litter, 37°9'7.92"N, 68°4'11.7"E, elev. 378 m, 20.04.2015. • 3♂, Shaartuz Distr., Tjikobod Vill. N of Khushody, small grove along road, poplar and Tamarix litter, sifting, 37°9'7.92"N, 68°4'11.7"E, elev. 378 m, 20.04.2015. • 3♂2♀, Nizhni Pyandzh, road

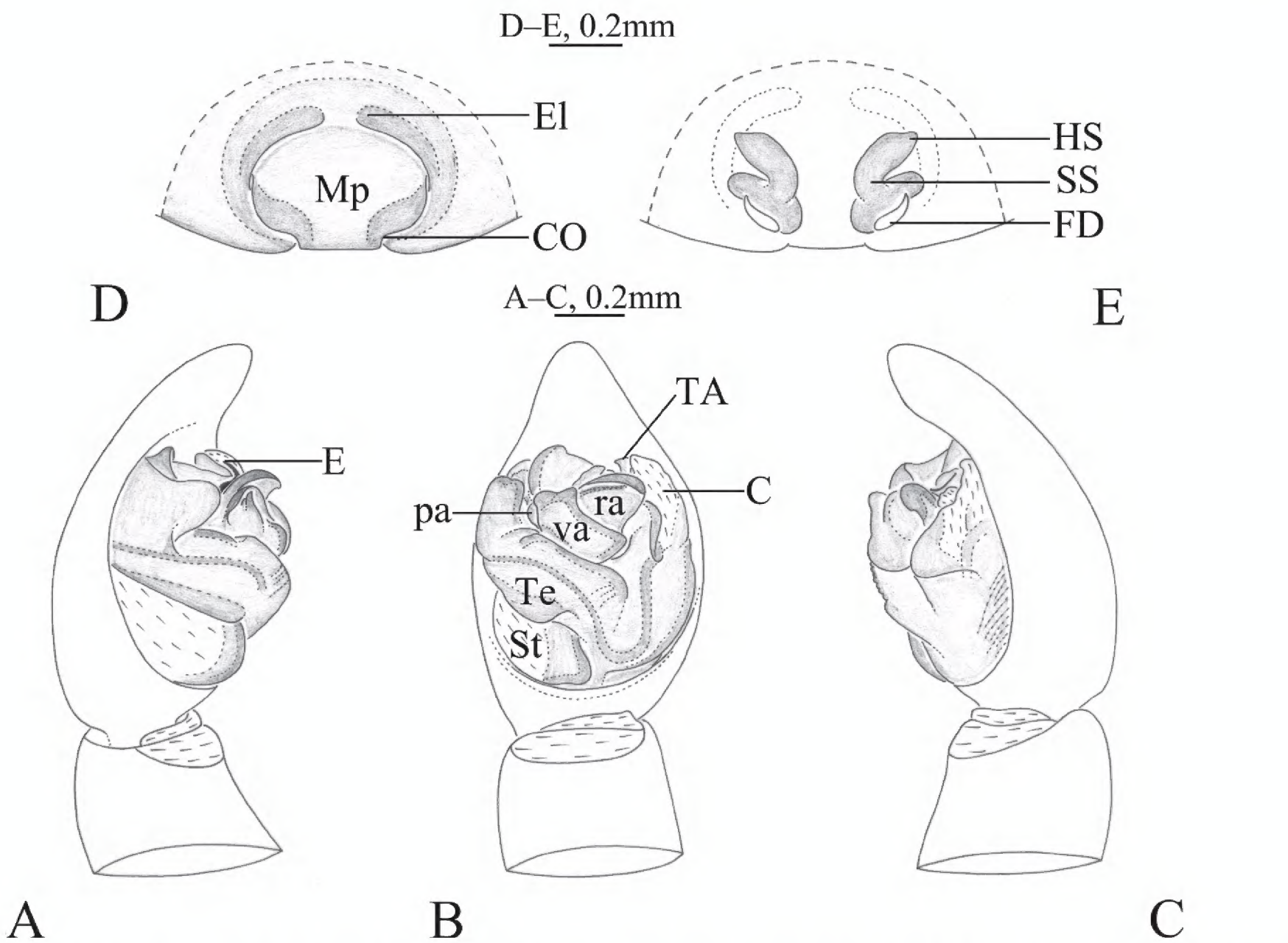

Figure 5. *Bogdocosa kronebergi* (Andreeva, 1976). **A.** Left male palp, prolateral view; **B.** Same, ventral view; **C.** Same, retrolateral view; **D.** Epigyne, ventral view; **E.** Same, dorsal view. Abbreviations: C = conductor; CO = copulatory opening; E = embolus; El = epigynal lobe; FD = fertilization duct; HS = head of spermathecae; Mp = median plate; pa = prolateral arm of median apophysis; ra = retrolateral arm of median apophysis; SS = stalk of spermathecae; St = subtegulum; TA = terminal apophysis; Te = tegulum; va = ventral arm of median apophysis (specimens from Hutubi County, Xinjiang, China).

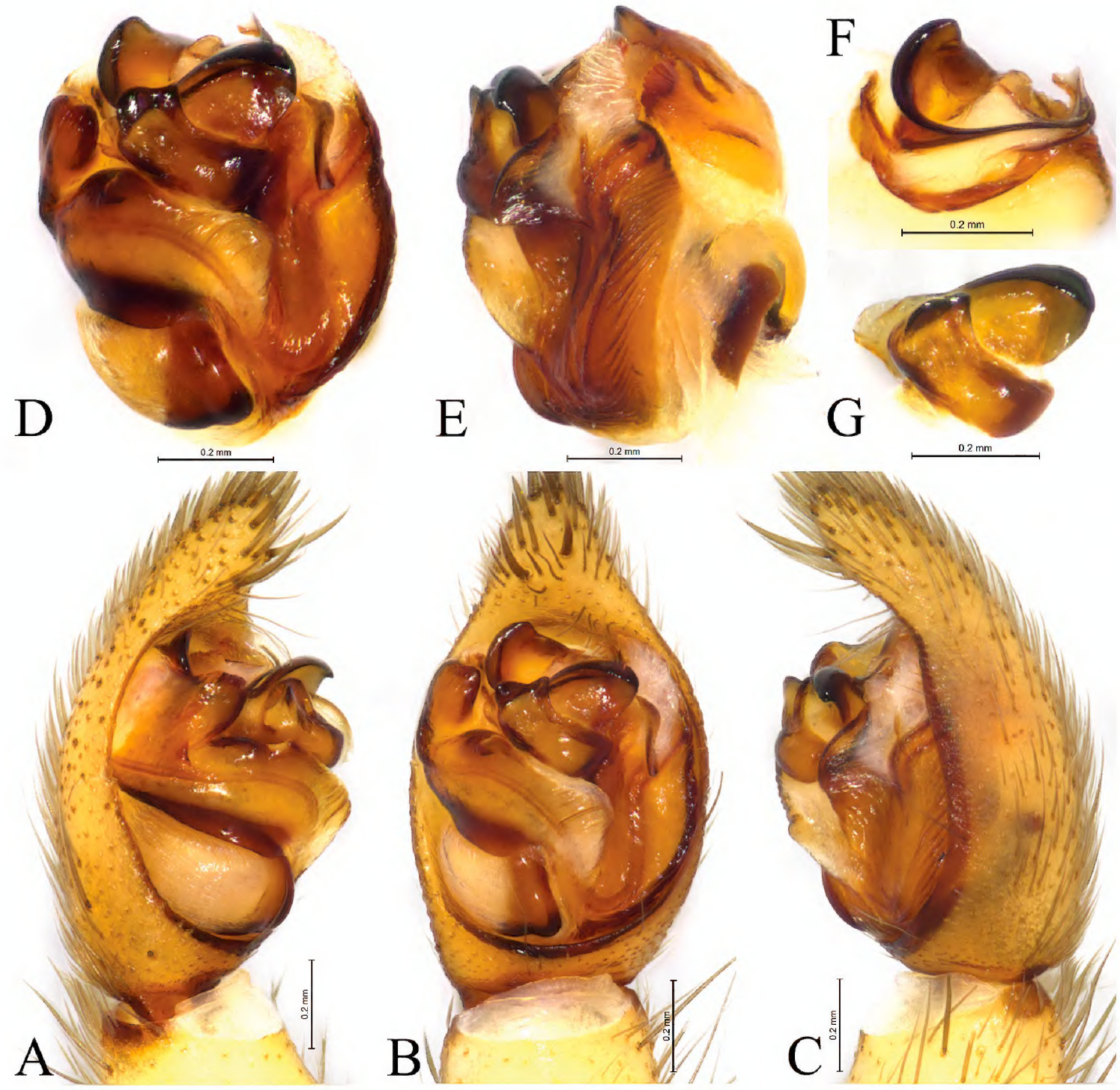

Figure 6. *Bogdocosa kronebergi* (Andreeva, 1976). **A.** Left male palp, prolateral view; **B.** Same, ventral view; **C.** Same, retrolateral view; **D.** Palp bulb, ventral view; **E.** Same, retrolateral view; **F.** Terminal part, ventral view; **G.** Median apophysis, ventral view (specimen from Hutubi County, Xinjiang, China).

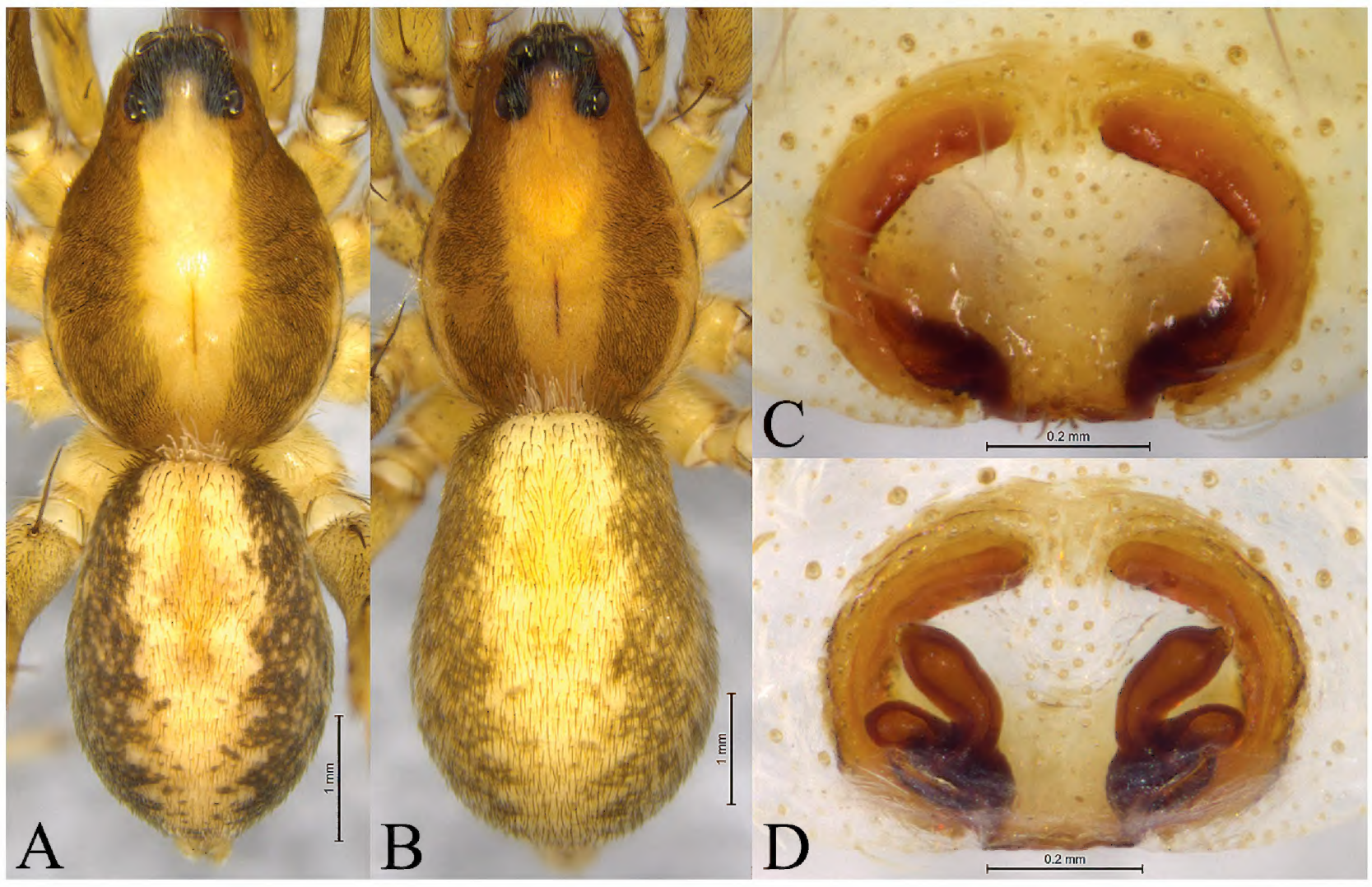

Figure 7. *Bogdocosa kronebergi* (Andreeva, 1976). **A.** Male habitus, dorsal view; **B.** Female habitus, dorsal view; **C.** Epigyne, ventral view; **D.** Same, dorsal view (specimens from Hutubi County, Xinjiang, China).

along reed stand, 37°14'2.7"N, 69°5'27"E, elev. 351 m, 5.05.2015, YMM leg.

Diagnosis. *Bogdocosa kronebergi* is distinguished from all other congeners by the rectangular ventral arm of median apophysis ventrally and oval median plate.

Description. See Ponomarev et al. (2008). Habitus as shown in Figs 7A, B, male palp as in Figs 5A–C, 6, 14B, epigyne as in Figs 5D, E, 7C, D.

Habitats. Most specimens in Tajikistan were collected in the litter under *Tamarix* bushes or poplar forest not far from water. In Russia, this species was also collected near water in arid places (Ponomarev et al. 2008).

Distribution. This species is distributed from Transcaucasia east to Xinjiang, north to 49^N in northwesternmost Kazakhstan and south to northeastern Iran. It is reported from Armenia (first record), Azerbaijan, Iran, Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan and China (Fig. 16).

Remark. Esyunin and Ponomarev (2018) noticed that *B. baskuntchakensis* is similar to *Pardosa multivaga* species group but not considered as the member of the same genus due to the lack of "spine-like hairs" on male sternum. Here the photo based on fresh specimen proves the presence of "spine-like hairs" (Fig. 15B).

Bogdocosa multivaga (Simon, 1880), comb. nov.

Figs 8–10, 14C, 15C, 16

Vernacular name: 多瓣博狼蛛

Pardosa multivaga Simon, 1880: 104, pl. 3, figs 2–3 (♂♀); Song and Hubert 1983: 8, figs 20–23 (♂♀); Song 1987: 235, fig. 191 (♂♀); Zhang 1987: 155, figs 131.1–2 (♀); Yin et al. 1997: 231, figs 109a–f (♂♀); Song et al. 1999: 332, figs 196F, N (♂♀); Song et al. 2001: 253, figs 157A–D (♂♀); Chen and Song 2004: 407, figs 10–28 (♂♀, S of *Pardosa dukouensis*); Zhang et al. 2022: 143, figs 105A–M (♂♀).

Pardosa dukouensis Qiu & Wang, 1992: 26, figs 1–3 (♀); Song et al. 1999: 330, figs 194I, T (♂♀).

Material examined. China, **Hebei:** 18♂7♀, Shahe City, 36°51'8"N, 114°29'49"E, elev. 65 m, 3.05.2002, F. Zhang leg. • 2♂, Shijiazhuang City, Shenze Co., 38°10'45"N, 115°12'53"E, elev. 37 m, 7.05. 2002, L. Xu leg. • 1♂2♀, Anguo City, 38°25'3"N, 115°20'2"E, elev. 30 m, 20.05.2002, F.P. Yang leg. • 1♂, Baoding City, 38°51'28"N, 115°25'14"E, elev. 22 m, 27.04.2007, Z.S. Zhang leg. • **Inner Mongolia:** 1♂1♀, Bayannur City, Wulateqianqi, Eerdengbulage, Wuliangsuhai, 40°51'34"N, 108°50'54"E, elev. 1025 m, 14.06.2015, T. Lu & G.Q.

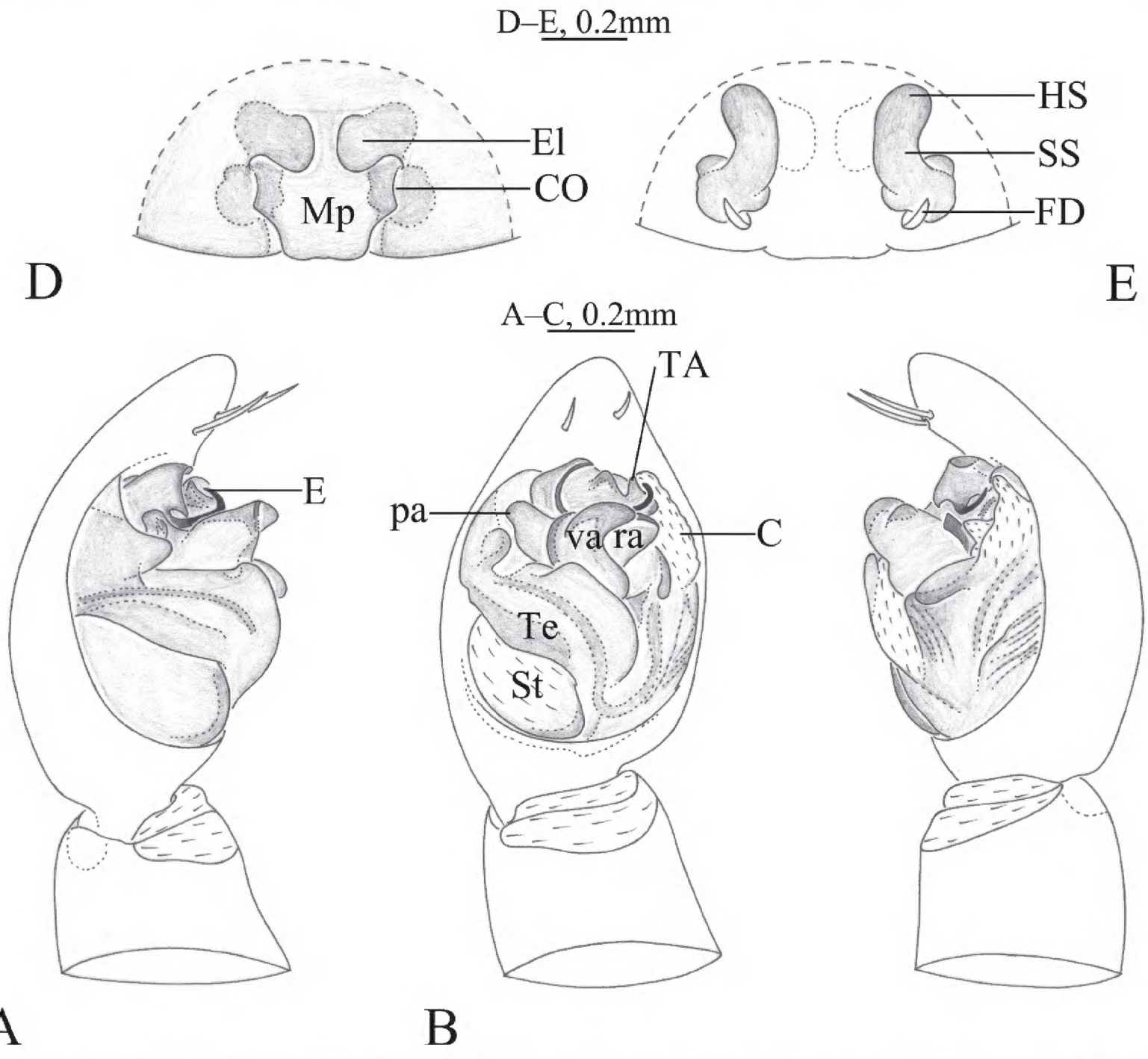

Figure 8. *Bogdocosa multivaga* (Simon, 1880). **A.** Left male palp, prolateral view; **B.** Same, ventral view; **C.** Same, retrolateral view; **D.** Epigyne, ventral view; **E.** Same, dorsal view. Abbreviations: C = conductor; CO = copulatory opening; E = embolus; El = epigynal lobe; FD = fertilization duct; HS = head of spermathecae; Mp = median plate; pa = prolateral arm of median apophysis; ra = retrolateral arm of median apophysis; SS = stalk of spermathecae; St = subtegulum; TA = terminal apophysis; Te = tegulum; va = ventral arm of median apophysis (specimens from Shahe City, Hebei, China).

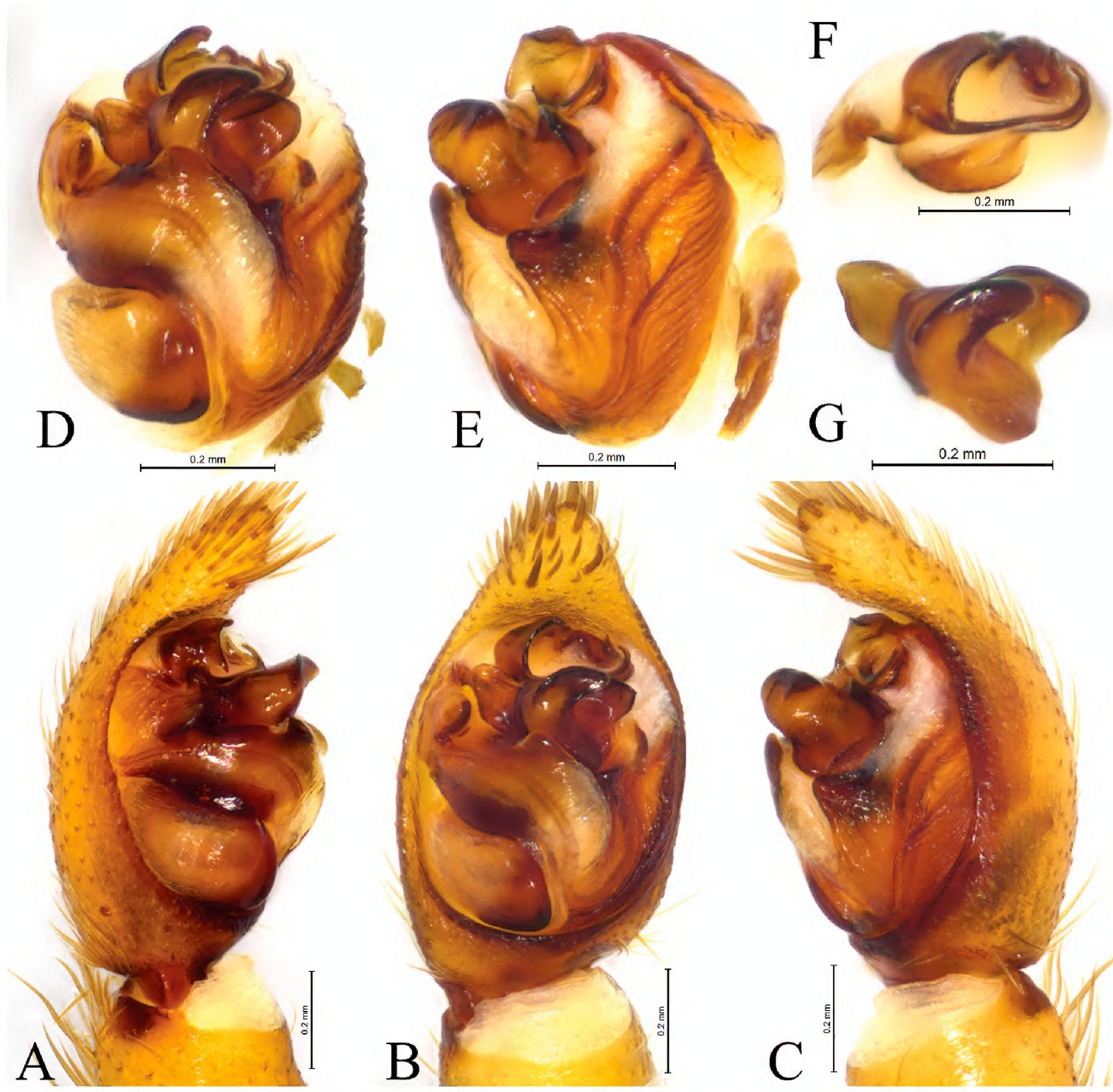

Figure 9. *Bogdocosa multivaga* (Simon, 1880). **A.** Left male palp, prolateral view; **B.** Same, ventral view; **C.** Same, retrolateral view; **D.** Palp bulb, ventral view; **E.** Same, retrolateral view; **F.** Terminal part, ventral view; **G.** Median apophysis, ventral view (specimen from Shahe City, Hebei, China).

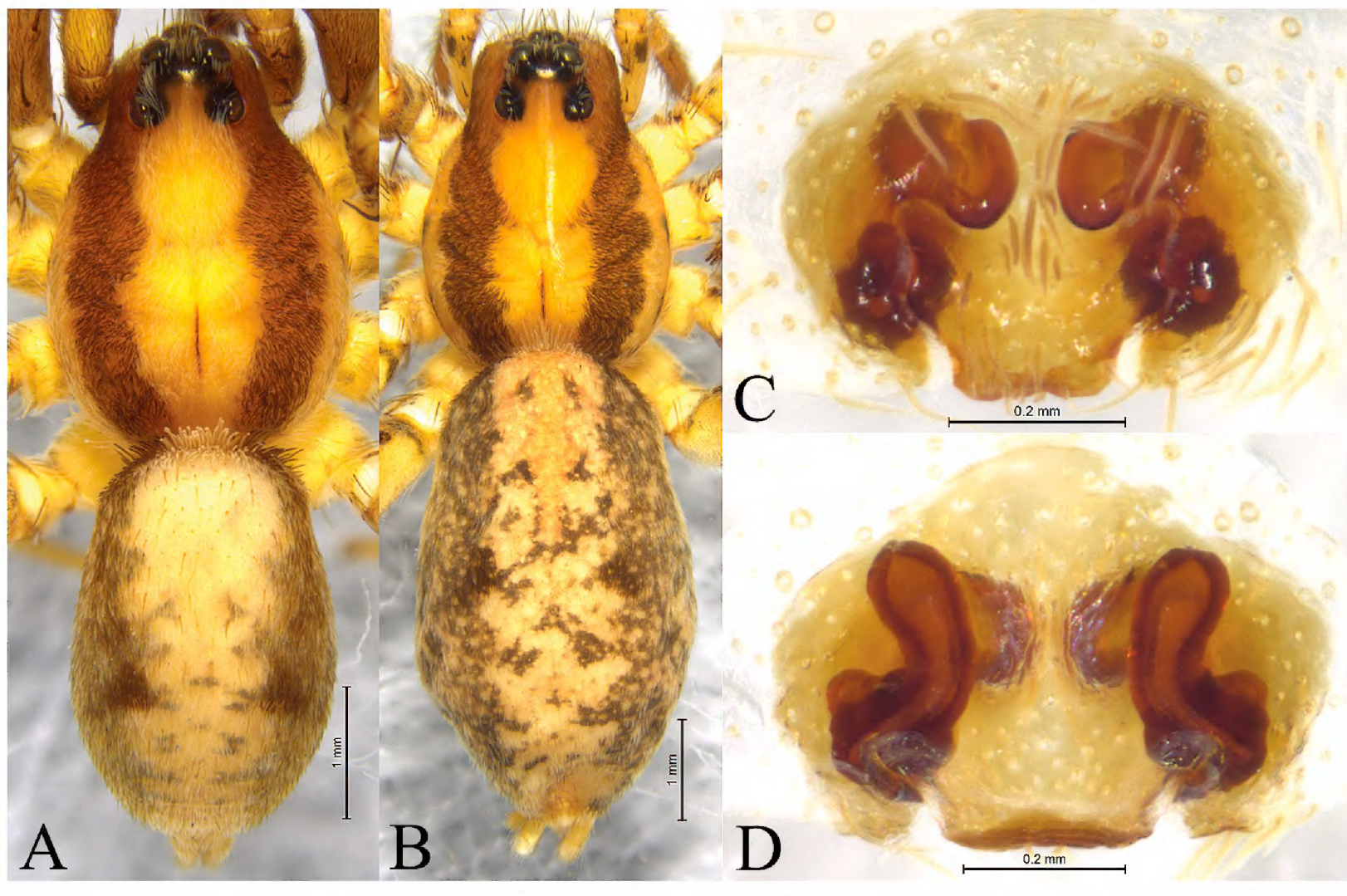

Figure 10. *Bogdocosa multivaga* (Simon, 1880). **A.** Male habitus, dorsal view; **B.** Female habitus, dorsal view; **C.** Epigyne, ventral view; **D.** Same, dorsal view (specimens from Shahe City, Hebei, China).

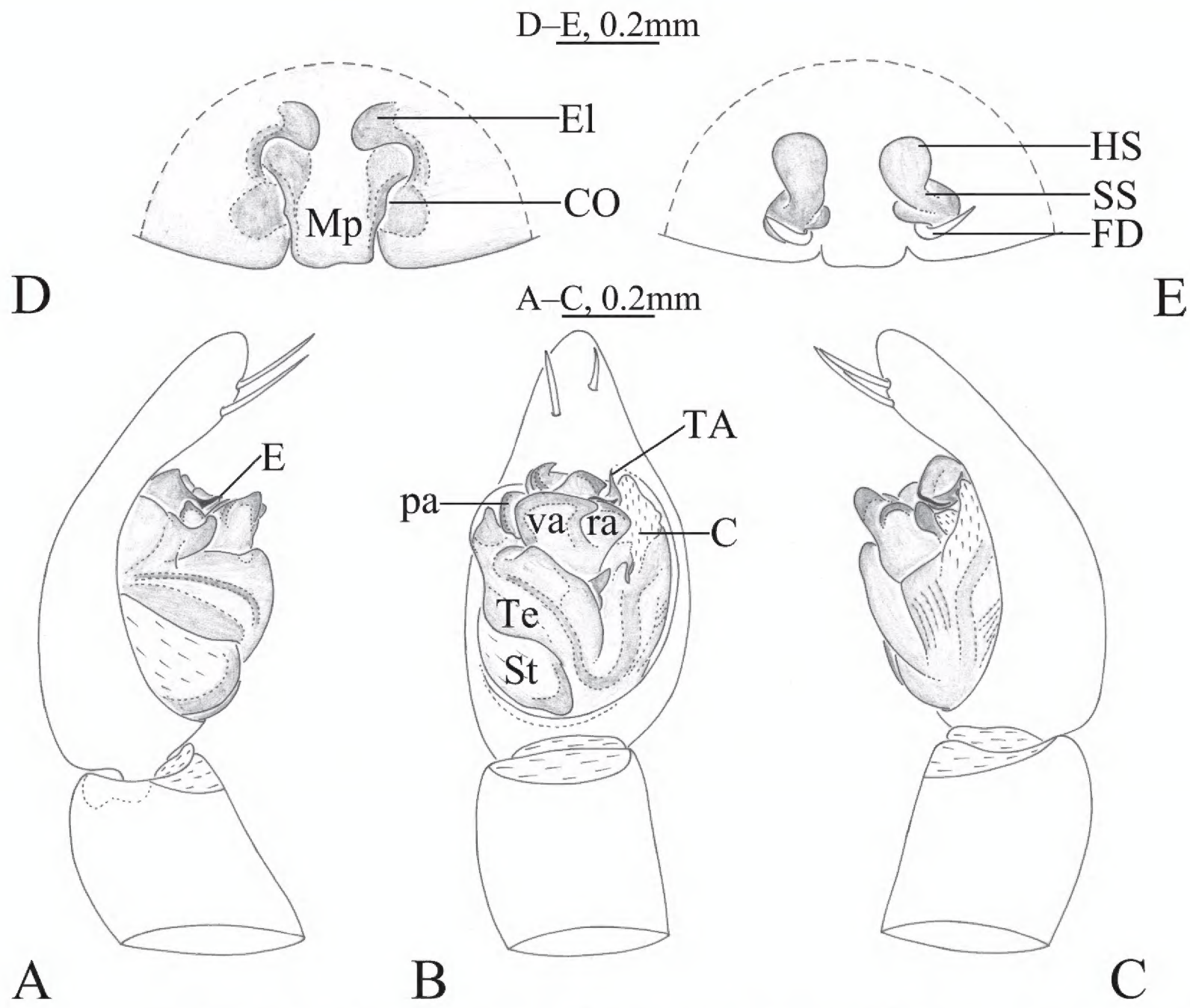

Figure 11. *Bogdocosa yunshani* Wang, Marusik & Zhang, sp. nov., holotype male (**A–C**) and paratype female (**D, E**). **A.** Left male palp, prolateral view; **B.** Same, ventral view; **C.** Same, retrolateral view; **D.** Epigyne, ventral view; **E.** Same, dorsal view. Abbreviations: C = conductor; CO = copulatory opening; E = embolus; El = epigynal lobe; FD = fertilization duct; HS = head of spermathecae; Mp = median plate; pa = prolateral arm of median apophysis; ra = retrolateral arm of median apophysis; SS = stalk of spermathecae; St = subtegulum; TA = terminal apophysis; Te = tegulum; va = ventral arm of median apophysis (specimens from Hutubi County, Xinjiang, China).

Huang leg. • 12♂3♀, Baotou City, Shiguai Dist., Wudangzhao Town, 40°47'28"N, 110°18'54"E, elev. 1488 m, 17.06.2015, T. Lu & G.Q. Huang leg.

Diagnosis. *Bogdocosa multivaga* is similar to *B. flavida* and *B. yunshani* sp. nov. in having a pair of epigynal lobes (Figs 8D, 10C; 1B, 2D, 4C; 11D, 13C), but can be distinguished by ventral arm of median apophysis digitiform ventrally in *B. multivaga* (Figs 8B, 9B, D, G, 14C) (vs. rod-shaped in *B. flavida*, Figs 2B, 3B, D, G, 14A; sectorial in *B. yunshani* sp. nov., Figs 11B, 12B, D, G, 14D). Females can be distinguished by interlobar space narrower than lobe width with individual lobes 1.5 times as wide as long in *B. multivaga* (Figs 8D, 10C) (vs. two epigynal lobes closely approximated with individual lobes 2 times as wide as long in *B. flavida*, Figs 1B, 2D, 4C; interlobar space equal to lobe width and individual lobes as wide as long in *B. yunshani* sp. nov., Figs 11D, 13C).

Description. Male (Fig. 10A) total length 6.13. Prosoma 3.19 long, 2.28 wide; opisthosoma 2.99 long, 1.99 wide. Eye sizes and interdistances: AME 0.12, ALE 0.10, PME 0.28, PLE 0.24; AME–AME 0.08, AME–ALE 0.03, PME–PME 0.17, PME–PLE 0.21. Clypeus height 0.18. Leg measurements: I 7.97 (2.16, 2.67, 1.89, 1.25); II 7.30 (2.02, 2.39, 1.75, 1.14); III 7.19 (1.95, 2.28, 1.88, 1.08); IV 11.25 (2.88, 3.44, 3.46, 1.47).

Palp (Figs 8A–C, 9A–G, 14C). Terminal apophysis hook-shaped, with short and thick end. Prolateral arm of median apophysis sclerotized. Ventral arm of median apophysis digitiform and narrower than retrolateral arm of median apophysis ventrally. Embolus bent into a human-ear-shape in ventral view. Lobe of embolic base with arc-shaped end. Conductor with two bifurcations.

Female (Fig. 10B) total length 7.80. Prosoma 3.33 long, 2.45 wide; opisthosoma 4.66 long, 2.77 wide. Eye sizes and interdistances: AME 0.12, ALE 0.10, PME 0.29, PLE 0.24; AME–AME 0.09, AME–ALE 0.06, PME–PME 0.20, PME–PLE 0.28. Clypeus height 0.15. Leg measurements: I 8.07 (2.33, 2.72, 1.85, 1.17); II 7.14 (2.11, 2.32, 1.63, 1.08); III 7.76 (2.08, 2.42, 2.09, 1.17); IV 12.26 (3.20, 3.57, 3.92, 1.57).

Epigyne (Figs 8D, E, 10C, D). Epigynal lobes equal in length and width. Interlobar space narrower than lobe width. Median plate trapezoid, as long as wide. Copulatory openings located on lateral margins of median plate. Spermathecal heads circular.

Distribution. China (Beijing, Inner Mongolia, Ningxia, Gansu, Shaanxi, Shanxi, Hebei, Shandong) (Fig. 16).

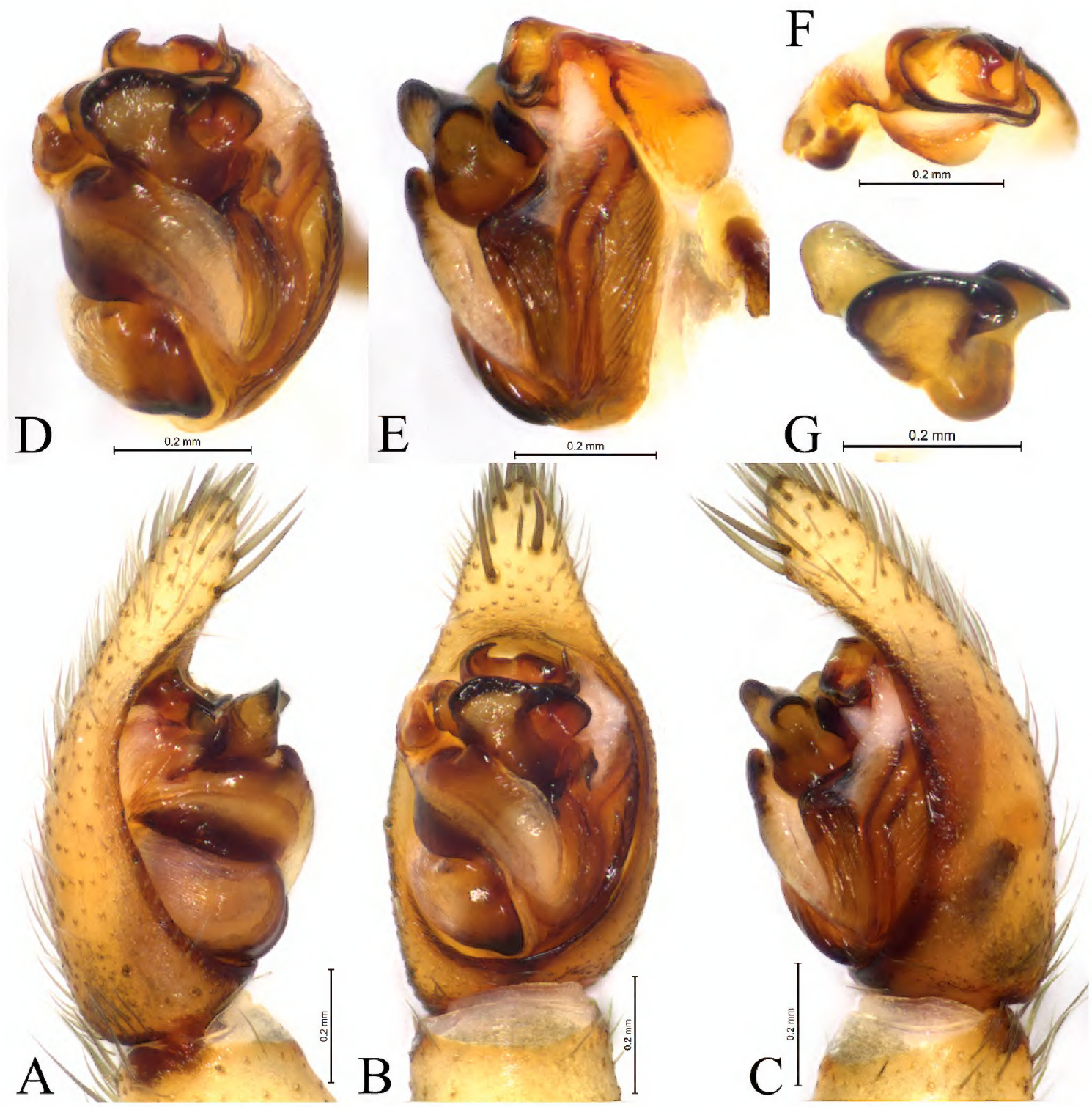

Figure 12. *Bogdocosa yunshani* Wang, Marusik & Zhang, sp. nov., holotype male (**A–C**) and paratype male (**D–G**). **A.** Left male palp, prolateral view; **B.** Same, ventral view; **C.** Same, retrolateral view; **D.** Palp bulb, ventral view; **E.** Same, retrolateral view; **F.** Terminal part, ventral view; **G.** Median apophysis, ventral view (specimens from Hutubi County, Xinjiang, China).

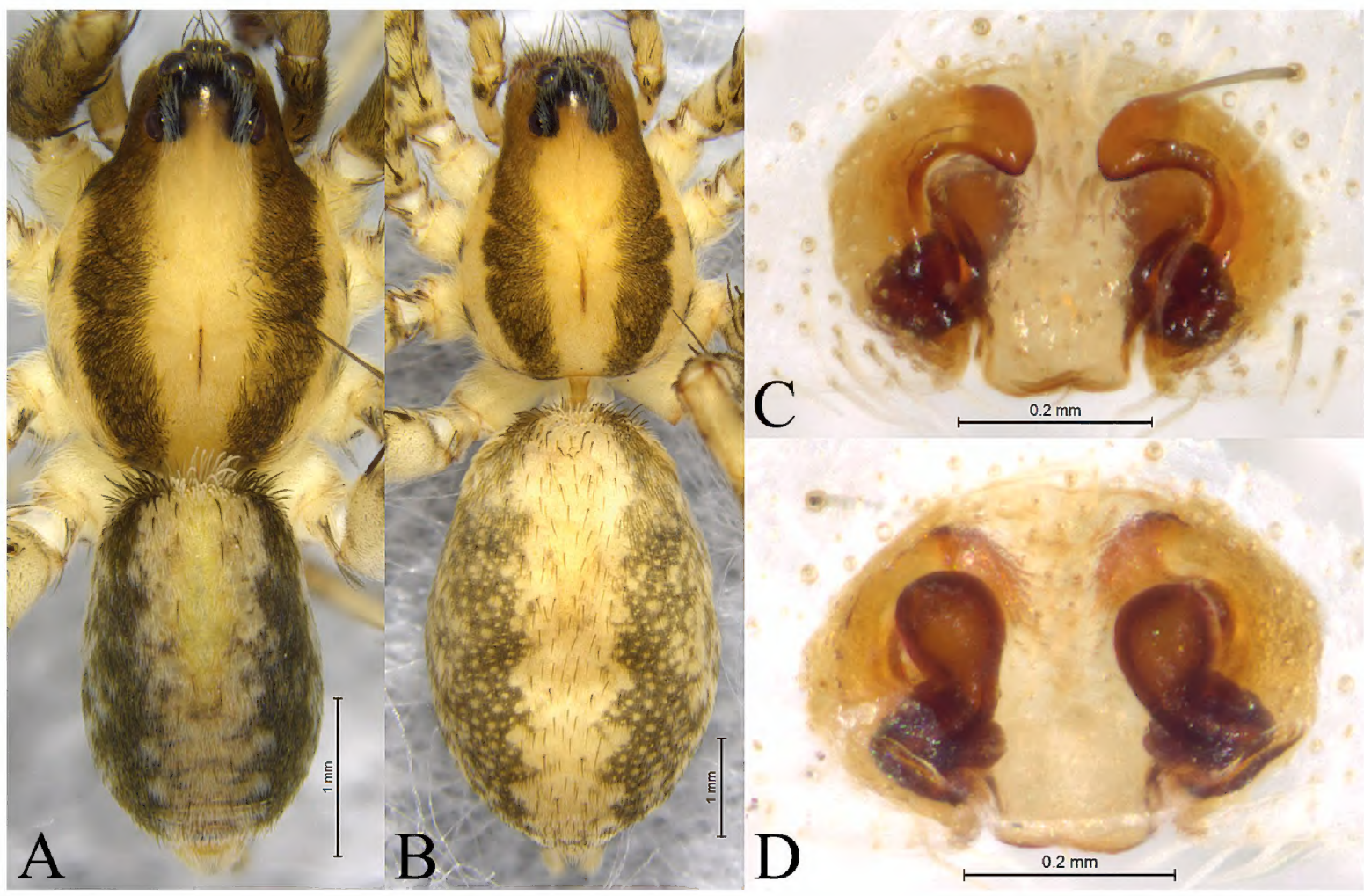

Figure 13. *Bogdocosa yunshani* Wang, Marusik & Zhang, sp. nov., holotype male (**A**) and paratype female (**B–D**). **A.** Male habitus, dorsal view; **B.** Female habitus, dorsal view; **C.** Epigyne, ventral view; **D.** Same, dorsal view (specimens from Hutubi County, Xinjiang, China).

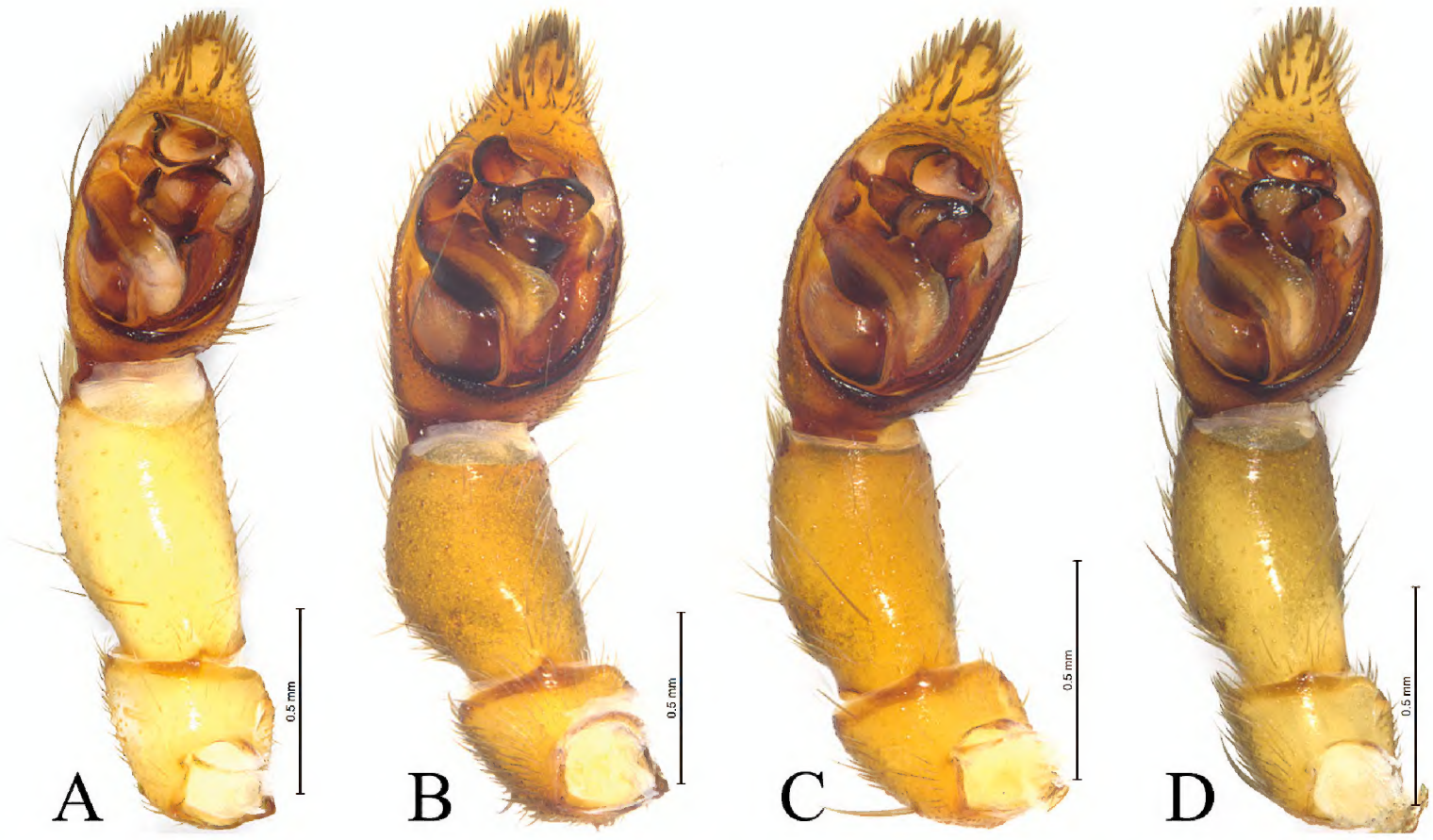

Figure 14. Male palps of *Bogdocosa* spp. **A.** *Bogdocosa flavida* (O. Pickard-Cambridge, 1885); **B.** *Bogdocosa kronebergi* (Andreeva, 1976); **C.** *Bogdocosa multivaga* (Simon, 1880); **D.** *Bogdocosa yunshani* Wang, Marusik & Zhang, sp. nov.

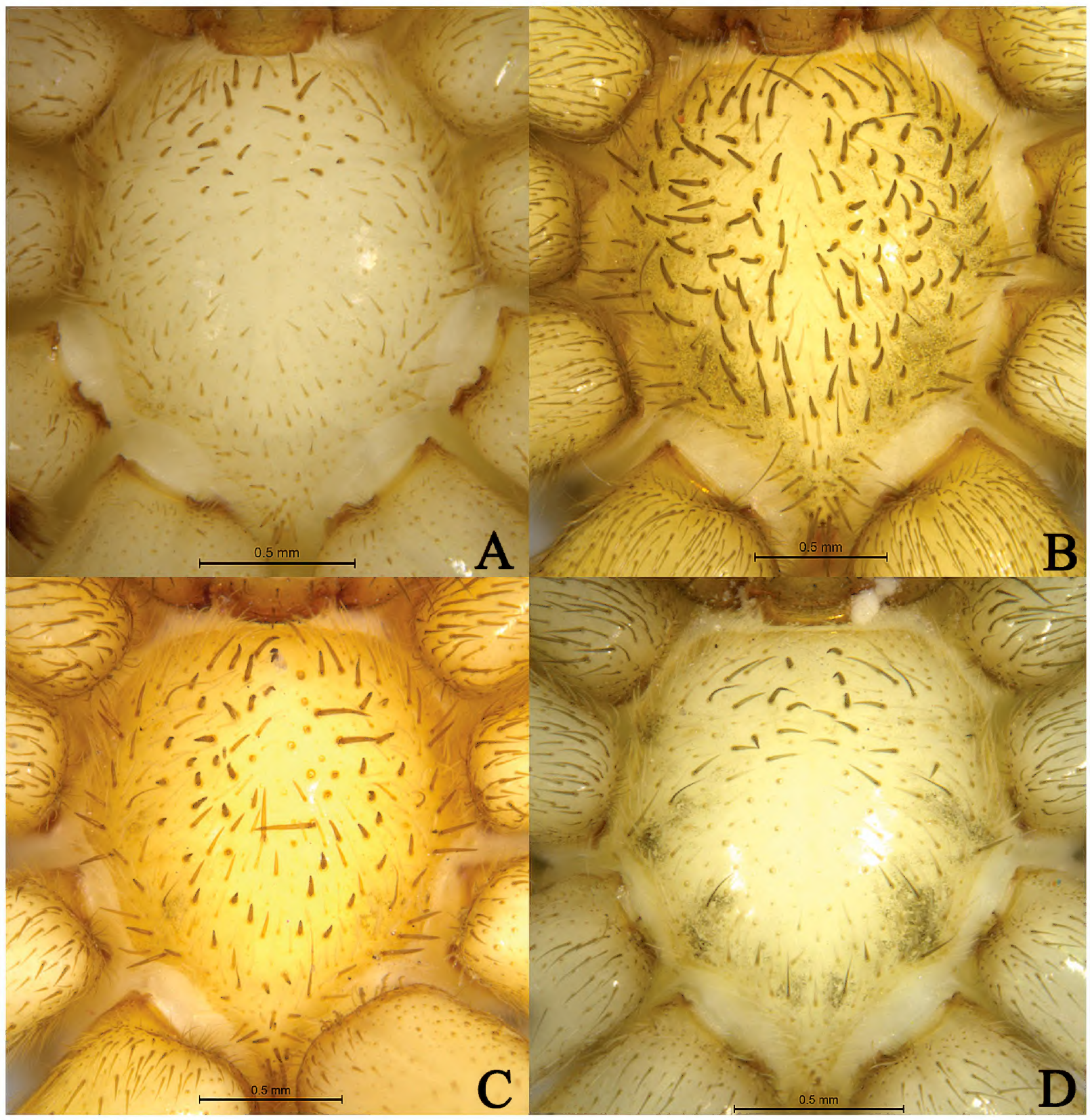

Figure 15. Male sternum of *Bogdocosa* spp. **A.** *Bogdocosa flavida* (O. Pickard-Cambridge, 1885); **B.** *Bogdocosa kronebergi* (Andreeva, 1976); **C.** *Bogdocosa multivaga* (Simon, 1880); **D.** *Bogdocosa yunshani* Wang, Marusik & Zhang, sp. nov.

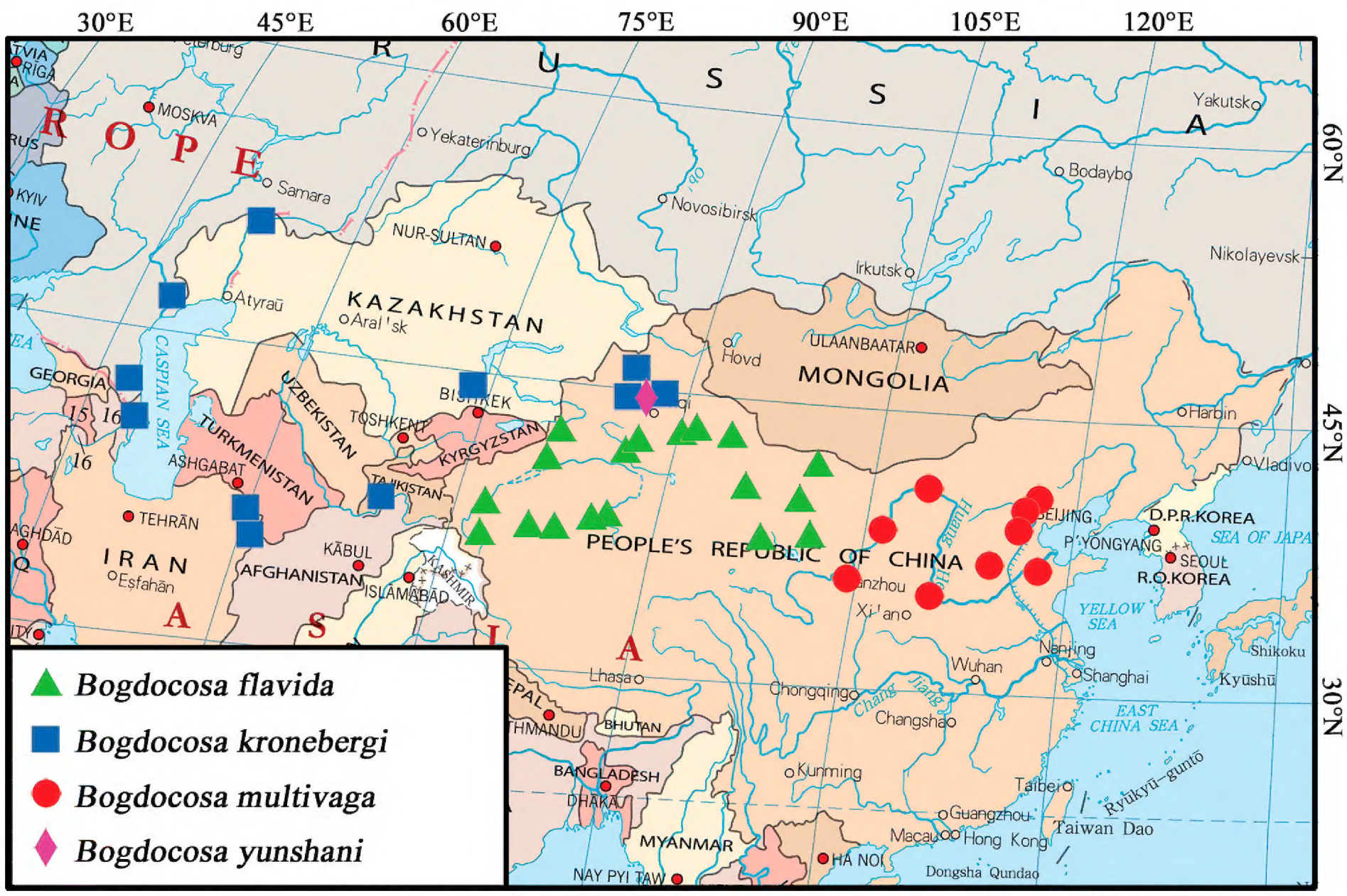

Figure 16. Distribution records of *Bogdocosa* species.

***Bogdocosa yunshani* Wang, Marusik & Zhang, sp. nov.**

https://zoobank.org/3BDB2A4A-5408-40C2-B6AE-585B563808E1

Figs 11–13, 14D, 15D, 16

Vernacular name: 蕴山博狼蛛

Type material. ***Holotype*** • ♂ (SWUC-T-LY-27-01): **China, Xinjiang**, Changji, Hutubi Co., No. 6 Reservoir, 26 May 2023, 44°17'26"N, 86°56'47"E, elev. 455 m, Y.S. Yang leg. ***Paratypes*** • 2♂3♀ (SWUC-T-LY-27-02 to 06), with same data as holotype.

Etymology. The specific name is a patronym honouring Mr. Yunshan Yang who collected this new species.

Diagnosis. *Bogdocosa yunshani* sp. nov. is similar to *B. flavida* and *B. multivaga* in having a pair of epigynal lobes (Figs 11D, 13C; 1B, 2D, 4C; 8D, 10C), but differ by ventral arm of median apophysis approximately sectorial ventrally in *B. yunshani* sp. nov. (Figs 11B, 12B, D, G, 14D) (vs. rod-shaped in *B. flavida*, Figs 2B, 3B, D, G, 14A; digitiform in *B. multivaga*, Figs 8B, 9B, D, G, 14C). Females can be distinguished by interlobar space equal to lobe width and individual lobes as wide as long in *B. yunshani* sp. nov. (Figs 11D, 13C) (vs. two lobes closely approximated with individual lobes 2 times as wide as long in *B. flavida*, Figs 1B, 2D, 4C; interlobar space equal to lobe width and individual lobes 1.5 times as wide as long in *B. multivaga*, Figs 8D, 10C).

Description. Male (holotype, SWUC-T-LY-27-01) (Fig. 13A) total length 5.09. Carapace 2.76 long, 1.90 wide; abdomen 2.29 long, 1.53 wide. Eye sizes and interdistances: AME 0.15, ALE 0.09, PME 0.25, PLE 0.19; AME–AME 0.07, AME–ALE 0.02, PME–PME 0.17, PME–PLE 0.20. Clypeus 0.11 high. Legs light yellowish-brown, with black markings. Leg measurements: I 7.15 (1.97, 2.39, 1.69, 1.10); II 6.77 (1.80, 2.24, 1.58, 1.15); III 6.57 (1.85, 1.93, 1.80, 0.99); IV 10.29 (2.67, 2.97, 3.33, 1.32).

Palp (Figs 11A–C, 12A–G, 14D). Terminal apophysis hook-shaped, with long and thin end. Prolateral arm of median apophysis membranous and ventral arm of median apophysis sectorial ventrally. Ventral arm of median apophysis wider than retrolateral arm of median apophysis. Embolus bent into a human-ear-shape. Conductor bifurcated.

Female (paratype, SWUC-T-LY-27-02) (Fig. 13B) total length 8.05. Carapace 3.26 long, 2.39 wide; abdomen 4.51 long, 2.96 wide. Eye sizes and interdistances: AME 0.13, ALE 0.12, PME 0.27, PLE 0.23; AME–AME 0.09, AME–ALE 0.03, PME–PME 0.21, PME–PLE 0.28. Clypeus 0.11 high. Leg measurements: I 7.96 (2.27, 2.84, 1.56, 1.29); II 7.53 (2.14, 2.50, 1.65, 1.24); III 7.61 (2.19, 2.26, 2.00, 1.16); IV 12.06 (3.04, 3.67, 3.79, 1.56).

Epigyne (Figs 11D, E, 13C, D). Epigynal lobes as long as wide. Interlobar space equal to lobe width. Median plate trapezoid, longer than wide. Copulatory openings situated on lateral margins of median plate. Spermathecal heads circular.

Variation. Males (*n = 3*) total length 5.09–5.44, females (*n = 3*) total length 6.62–8.05.

Distribution. China (Xinjiang) (Fig. 16).

Funding

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Acknowledgements

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